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STAR WARS
The Soviet Thrust

Moscow implies that the U.S. is a lone runner in the race for a defense against missiles. But the Kremlin actually may be ahead in this competition—on earth if not in space.

The United States is not alone in its controversial search for a system to defend against nuclear-missile attack.

What emerges from a close examination of Soviet military plans is evidence that the U.S.S.R. is pursuing its own version of President Reagan's so-called Star Wars scheme. The Kremlin is engaged in an ambitious drive to develop lasers and other exotic weaponry for a space-based defensive shield.

This is only one element of the Soviets' Star Wars plan. Even more worrisome for the U.S. in the short run is another Soviet project that is seen as the groundwork for an earth-based missile-defense system. Already being deployed are sophisticated missile-tracking radars, interceptors and at least one surface-to-air missile that may be able to knock down streaking warheads.

President Reagan, in his inaugural address, focused attention on the Kremlin's Star Wars effort, asserting that the Soviets "already have strategic defenses that surpass ours."

Moscow began experimenting with space weapons more than 20 years ago, long before the concept became a cause for worldwide dispute. The U.S.S.R. already has in operation the only antisatellite system in the world.

The system gives the Soviets the capacity to launch the space equivalent of a Beirut car bomb into low-altitude orbit. Once maneuvered within range of an enemy communications or spy satellite, the device can be made to explode with destructive force.

This satellite-killer system is still relatively primitive. Like the U.S., the Soviets are working to create Buck Rogers-style "directed energy" weapons that focus intense beams of light or atomic particles at very high power.

Pentagon officials maintain that Moscow is pumping three to five times as much effort as Washington is into this kind of research. Reagan has requested some 3.7 billion dollars in his 1986 budget for additional work on the program, officially named the Strategic Defense Initiative, more than double the 1.4 billion being spent this year.

While some analysts vigorously disagree with Pentagon estimates of Moscow's efforts, American intelligence has disclosed the presence in the Soviet Union of a number of secret installations devoted to development of space-weapons technology.

At the best known of these Soviet research centers, located at Sary Shagan in Soviet central Asia, technicians have erected two full-scale laser prototypes plus an experimental particle-beam device. A particle beam, in principle, could fire the synthetic equivalent of lightning bolts.

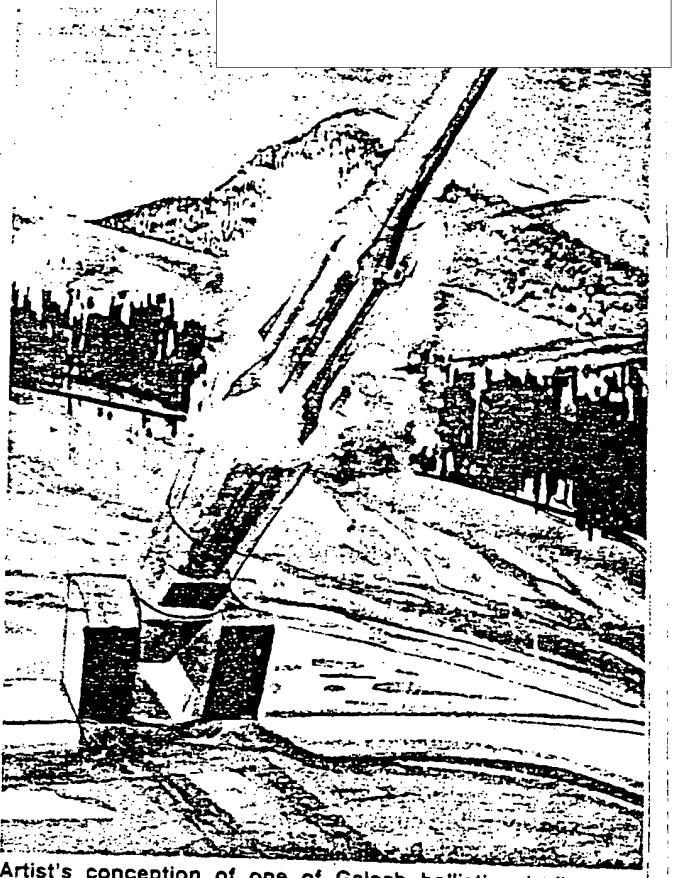
The assumption among some Western experts is that the weapons, if perfected, could blast targets orbiting in near space, just above earth's atmosphere. Lasers could thus strike at many Western satellites, including those generating weather and oceanic data as well as civilian communications.

The more critical U.S. military spacecraft orbiting at higher altitudes would also become vulnerable should the Soviet Union ever succeed in mounting these weapons aboard satellites or in manned space stations.

The Defense Department believes Moscow might even be able to launch the first prototype of a space-based laser antisatellite system in the late 1980s or early 1990s. An improved ground-based laser system capable of attacking satellites within a range of a few thousand kilometers could be established in the mid-1990s.

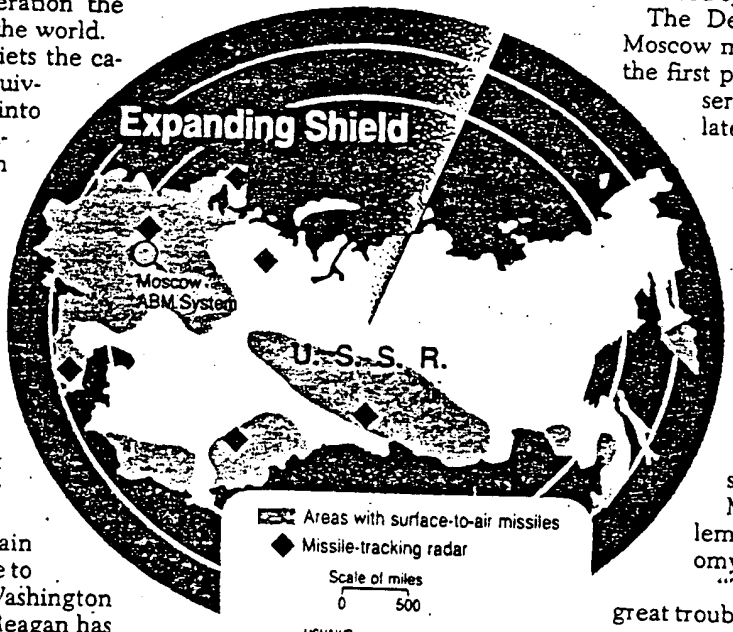
Myriad obstacles must be overcome before the Soviets perfect a laser weapon that is both dependable and practical. When it comes to putting such a weapon into space, Moscow could run into problems achieving the desired economy of size and automation.

"The Soviets have always had great trouble with the reliability of their space systems," says Stephen M. Meyer



ILLUSTRATIONS BY HAROLD SKELGER

Artist's conception of one of Galosh ballistic-missile interceptors that defend Moscow.



of the Massachusetts Institute of Technology, a leading expert on Soviet defense programs. "They could—on a static, ground-testing basis—beat us to the punch with a laser. But it wouldn't be very good or very useful."

Jeff Hecht, another authority and author of the widely acclaimed book *Beam Weapons*, adds that "it is one thing to be able to damage a satellite that obligingly floats by through the laser beam when beam-transmission conditions are just right. But it is quite another to be able to zap satellites on demand."

Radio-wave weaponry. In a different area, Moscow is also believed to be heavily involved in conducting secret research into the use of microwaves as weapons. The Soviets have long been interested in the destructive potential of these radio-frequency weapons.

In fact, the Pentagon maintains, Soviet radio-frequency technology has already advanced to the stage where it could lead to development of a prototype, short-range weapon in the near future. Some Western systems would be vulnerable to such a weapon, which could damage electronic components.

The exact nature of the missions envisioned for microwave weaponry is speculative. But in space, the main interest could lie in the potential for either outright destruction of space vehicles or the crippling of them by burning out electronic circuitry.

Impressive as the Soviet program is, expert opinion is far from unanimous on the question of whether it surpasses—or even matches—America's capabilities. One area where the U.S.S.R. clearly lags is in technologies for spotting and tracking small objects in space. It also suffers a relative weakness in computer know-how. Both are essential to devising any antiballistic system.

At present, the U.S. is using so-called fourth-generation computers capable of executing 100 million instructions per second. The Soviets, however, are still trying to master the third generation.

Still, even those skeptical of Moscow's current Star Wars prospects have no doubt that the Soviet Union can eventually catch up with advances made by the U.S. "If we have a race in space, it will take the Russians longer," says MIT's Meyer. "But they surely will get up there with us. It is all a function of time."

However the U.S. and the Soviet Union stack up in the competition to build space-based antimissile arms, the Soviets appear to be on stronger ground in development of a ground-based antiballistic-missile system. In fact, Washington alleges that the Kremlin already is violating the 1972 superpower treaty stringently limiting development of ABM systems.

At present, Moscow is giving high priority to filling gaps in its radar grid—a key element in any plan to build a workable ABM system. The most obvious feature of this effort is the buildup of immense Soviet "phased array" radars. These are capable of scanning the skies in all directions, locating numerous targets, tracking them simultaneously and then relaying data to other sites. Six of these facilities—at Olenegorsk, Pechora, Sary Shagan, Lyaki, northern Moscow and Krasnoyarsk—are already in operation or under construction.

U.S. intelligence believes that the most crucial station—the Pushkino radar at Moscow—has been completed. A large, pyramid-shaped structure 500 feet wide at the base and 120 feet high, the Pushkino facility probably would provide "battle management" for Moscow's own defenses and assign tracking targets to other radars.

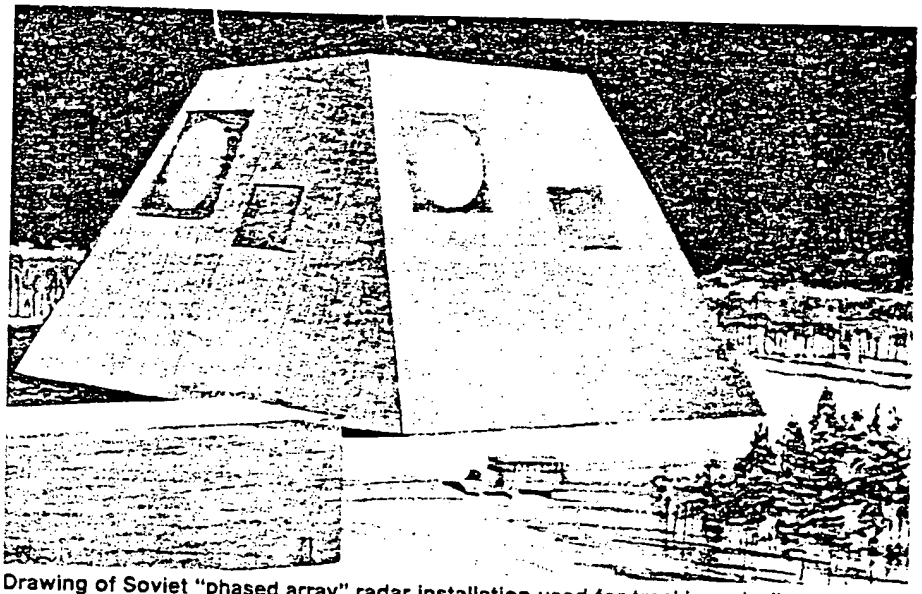
But even before the big sites are fully operational, other aspects of the Soviet Union's radar coverage could be expanded. Pentagon officials say Moscow is producing small mobile radars that could be in use in a few months.

Concern about radar advances is heightened by what Washington views as an impressive improvement in the Soviet force of missile interceptors—weapons that would actually be sent aloft to knock down ICBM warheads. Formerly, the Soviet force consisted entirely of Galosh interceptors—huge, clumsy nuclear-tipped missiles of dubious utility. Now, however, the Kremlin is replacing some of the Galosh weapons with a high-acceleration interceptor missile, the SH-08, which poses a more formidable threat to American ICBM's.

With this missile, the Soviet Union for the first time is in a position to sort out real warheads from decoys sent to confuse defenders. That is because its high speed enables Soviet gunners to hold their fire until warheads enter the atmosphere, where they are easier to identify. Result: Higher probability of hitting actual incoming warheads.

Even more troubling, intelligence experts say, is evidence that the Soviets may be developing the capability to rapidly reload the silos containing the SH-08. This has raised concern that Moscow may mass-produce the rockets and stockpile them for rapid deployment.

Of all developments, none is more disturbing to some U.S. experts than what is known as the "SAM upgrade" problem—the danger that the vast Soviet network of surface-to-air missiles may be in the midst of acquiring power to shoot down ballistic-missile warheads.



Drawing of Soviet "phased array" radar installation used for tracking missiles.

The Soviet military has deployed 10,000 of these weapons around Soviet territory. Until recently, they have been viewed almost exclusively as anti-aircraft missiles, unable to attack the faster flying missile warheads.

Now, there is concern that this situation is changing. Attracting greatest U.S. attention is the Soviet SA-X-12, a mobile, high-altitude surface-to-air missile to be deployed in large numbers across Soviet territory. Some U.S. officials claim that the SA-X-12 has been successfully tested against Soviet intermediate-range missiles comparable to America's submarine-launched weapons.

All of those developments are certain to be aired in the new arms talks in Geneva as American negotiators move to challenge the Soviet propaganda campaign that insists Star Wars is a U.S. monopoly. □

By ROBERT S. DUDNEY